

Surgical Pearl: The use of Polaroid photography for mapping Mohs micrographic surgery sections

Ming H. Jih, MD, PhD, Leonard H. Goldberg, MD, Paul M. Friedman, MD, and Arash Kimyai-Asadi, MD
Houston, Texas

Accurate tissue orientation and precise mapping of tissue specimens are fundamental to the technique of Mohs micrographic surgery. The ideal method for tissue mapping would allow for precise replication of both the surgical defect and the excised tissue specimens in a reliable, rapid and reproducible manner. The most commonly utilized mapping technique is a hand-drawn sketch of the tissue specimens, which can be used to map and orient the tissue.¹ The main drawback to hand-drawn maps is the difficulty in replicating the exact size, shape, orientation, and anatomic context of the excised tissue specimens. This is particularly problematic for complex tumors requiring multiple stages or those resulting in large, irregular surgical defects with multiple tissue specimens. In recent years, digital photography has been utilized for Mohs tissue mapping.^{2,3} However, these digital systems are more complicated to incorporate into a practice, are more time consuming and expensive, and do not produce a 1:1 image.

Polaroid photography was invented in 1947 by Edwin Land, an American physicist who devised a one-step process for taking, developing, and printing instant photographs. The point-and-shoot Polaroid camera is both easy to master and rapid to use, producing, in less than one minute, vivid color prints that retain their quality over time. Using a macro feature, the Polaroid camera can recreate a 1:1 exact scale replica of a subject. This not only allows accurate and anatomically correct mapping and orientation of tissue specimens, but also makes

possible accurate measurement of the surgical defect and postoperative closure sizes for permanent documentation.

The process of using Polaroid pictures during Mohs surgery is depicted in Fig 1, A-D. A Polaroid picture of the tumor is taken before surgery (Fig 1, A). The removed tissue is cut, flattened, and placed on nonabsorbent pads (Telfa, Kendall, Tyco Healthcare Group LP, Mansfield, Mass). The Telfa containing the tissue specimens is held adjacent to the tumor, maintaining proper tissue orientation. A Polaroid picture is taken with a scale of 1:1. The histotechnologist then adds surgical marking dyes to the tissue, and accordingly marks the Polaroid picture with solid, dotted, and/or squiggly lines corresponding to the dye color using a permanent marking pen. In addition, each piece of tissue on the Polaroid is assigned a number corresponding to a histology slide being prepared from that tissue specimen.

During microscopic analysis, areas with residual tumor are marked directly on the Polaroid picture using correction fluid, as the markings are permanent and the stark white color is clearly visible (Fig 1, B). The Polaroid picture is then utilized intraoperatively during subsequent stages of surgery, providing a direct anatomic correlate to any areas with residual tumor. When the surgical margins are free of tumor, the Polaroid picture is marked accordingly using a permanent marking pen (Fig 1, C). At the conclusion of Mohs micrographic surgery, the Polaroid can also be utilized to review possible surgical repair options before returning to the patient. A final Polaroid is obtained from the surgical closure (Fig 1, D).

The cost of Polaroid photography includes the cost of the camera and pictures. The cost of a Polaroid Macro 5 SLR camera (Polaroid, Waltham, Mass), which includes macro lenses that provide magnifications of 0.2 \times , 0.4 \times , 1 \times , 2 \times , or 3 \times , is approximately \$700 (Fig 2). Because the size of the lesion photographed is limited by the size of the Polaroid image (9.2 \times 7.3 cm), one can use the

From DermSurgery Associates.

Funding sources: None.

Conflicts of interest: None identified.

Reprint requests: Ming H. Jih, MD, DermSurgery Associates, 7515

Main Suite 210, Houston, TX 77030. E-mail: ming_jih@yahoo.com.

J Am Acad Dermatol 2005;52:511-3.

0190-9622/\$30.00

© 2005 by the American Academy of Dermatology, Inc.

doi:10.1016/j.jaad.2004.08.031

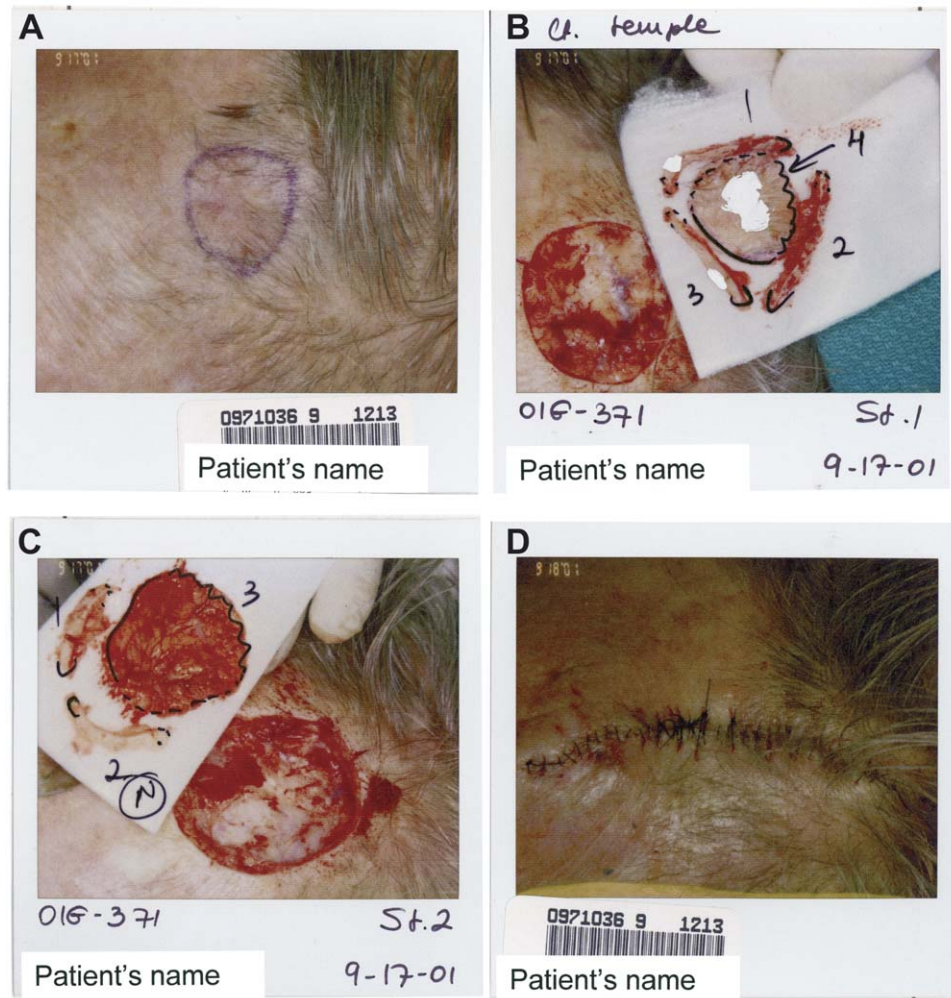


Fig 1. A Polaroid picture is taken preoperatively (**A**) and after the first stage (**B**). Polaroids are marked to correspond to the tissue sections excised and areas with tumor are marked on the Polaroid (**B** and **C**). When negative histologic margins are attained, the Polaroid picture is marked accordingly (**C**). A Polaroid picture is taken of the final surgical repair (**D**).

0.4 \times or 0.2 \times magnification for larger tumors. A less expensive unit is the Polaroid Macro 3 SLR camera, which provides magnifications of 1 \times , 2 \times , or 3 \times and costs approximately \$500. The units utilize Polaroid Spectra film, which is produced in packs containing 10 exposures. The cost of film is approximately \$1 per picture. The film pack also includes a battery that supports the flash, eliminating the need for frequent changing or recharging of batteries.

The use of a Polaroid camera requires virtually no training. For accurate replication of a two-dimensional surface, the Polaroid should be held parallel to the skin. The unit produces two beams of light upon pressing the shutter button. The

camera is moved back and forth until the two beams intersect at one point. At that position, which is 25 cm from the subject when a 1 \times magnification is used, the picture taken will be in perfect focus. There is a bright flash produced by two electronic flashes built into the front of the unit, ensuring that there is both adequate lighting and a quick shutter speed, eliminating blurring because of motion artifacts. At a 1 \times magnification, the depth of field is 2.2 cm. The unit can imprint the date and/or time the picture was taken. The pictures include white margins for labeling patient and tumor information. The pictures are easy to store in patient charts and are quick to review during subsequent patient visits.



Fig 2. Polaroid Macro 5 SLR camera. Note the dial for choosing the magnification on top of the unit, and the two integrated front flashes.

In conclusion, although there is added expense of using Polaroid photography in Mohs surgery compared to hand drawing, the numerous advantages, including ease of use, improved precision of mapping, and improved documentation capability, make Polaroid photography an excellent option for tissue mapping during Mohs micrographic surgery.

REFERENCES

1. Silapunt S, Peterson SR, Alcalay J, Goldberg LH. Mohs tissue mapping and processing: a survey study. *Dermatol Surg* 2003; 29:1109-12.
2. Papa CA, Ramsey ML. Surgical Pearl: Digital imaging for mapping Mohs surgical specimens. *J Am Acad Dermatol* 2000;43:712-3.
3. Alcalay J. Digital computerized mapping in Mohs micrographic surgery. *Dermatol Surg* 2000;26:692-3.

Medical Pearl: Gentian violet to highlight the cornoid lamella in disseminated superficial actinic porokeratosis

Chad J. Thomas, MD, and Dirk M. Elston, MD
Danville, Pennsylvania

Porokeratosis is a disorder of keratinization characterized by a clinically and histologically distinctive ridgelike border called the cornoid lamella. Five clinical variants of porokeratosis are recognized including classic porokeratosis of Mibelli, porokeratosis palmaris et plantaris disseminata, linear porokeratosis, punctate keratosis, and disseminated superficial actinic porokeratosis (DSAP).¹

When easily visualized, the cornoid lamella makes the diagnosis of porokeratosis rather obvious, but when more superficial and subtle, as can commonly be the case with DSAP, the clinical diagnosis is not so clear. Classically, DSAP presents in the third

to fourth decade as multiple, slowly expanding hyperkeratotic or hyperpigmented annular plaques on the sun-exposed extremities.² Depending on the presentation, the lesions may be mistaken for multiple actinic keratoses or may easily be confused with flat seborrheic keratoses, stucco keratoses, disseminated granuloma annulare, or atrophic annular lichen planus.³

To avoid possible misdiagnosis and, therefore, errant treatment, and to avoid an unneeded biopsy, it is important to recognize DSAP clinically. We present a quick and noninvasive technique to help identify the characteristic cornoid lamella of DSAP.

After painting the hyperkeratotic border of a suggested lesion of DSAP with gentian violet from a surgical marking pen (may also use tolulene blue or crystal violet), the stain is then removed with an alcohol swab. The cornoid lamella associated with porokeratosis will retain the gentian violet after the stain from the surrounding skin is removed with the alcohol, thus, revealing the characteristic raised border (Figs 1 and 2).

From the Department of Dermatology, Geisinger Medical Center.
Funding sources: None.

Conflicts of interest: None identified.

Reprint requests: Dirk M. Elston, MD, 100 N Academy Ave, Danville,
PA 17822. E-mail: DMELSTON@geisinger.edu.

J Am Acad Dermatol 2005;52:513-4.

0190-9622/\$30.00

© 2005 by the American Academy of Dermatology, Inc.

doi:10.1016/j.jaad.2004.06.050